

## TEMPORAL LOBE EPILEPSY: PSYCHIATRIC AND BEHAVIORAL ASPECTS \*

SHIRLEY M. FERGUSON

Research Associate in Psychiatry  
Columbia University College of Physicians and Surgeons

A RECENT review of the psychiatric literature on the behavioral aspects of epilepsy suggested that the formulations of behavioral disturbances in epileptics primarily reflected psychiatric theory predominant at the time.<sup>1</sup> Currently, the pendulum of psychiatric research is lingering on the side of organic investigations of behavior. At the same time, the recent enthusiasms produced by drug therapy in psychiatry have been tempered by the realization that other influences are needed; that time, employment, and opportunities to experience new interpersonal patterns are necessary in conjunction with drugs, to produce optimum results. No problem is more appropriate to the times than the patient with temporal lobe epilepsy who has demonstrable physiologic dysfunction of the brain, a culturally unpopular and misunderstood ailment; who is generally under the effect of some medication; and who has emotional problems.

Since the recognition of temporal lobe epilepsy as an entity,<sup>2-4</sup> the behavioral manifestations presented by these patients have not been specifically investigated by neurologists and neurosurgeons. On the other hand, psychiatrists have studied these manifestations in themselves, concentrating either on the psychodynamic significance of the seizure content<sup>5-7</sup> or on the correlation of the psychiatric classification of these patients with neuropathological findings.<sup>8</sup> The interictal behavior disorder has been represented by many as though it were a psychological stream flowing between and around the seizure islands without direct contact. The temporal lobe seizure is generally conceived in the same terms as a classical grand mal attack. Yet, while the *grand mal*

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attack is a circumscribed event starting at an identifiable moment and having definite duration, the temporal lobe seizure may be heralded for days and is often unrecognized in its occurrence even by the patient or by those most intimately in contact with him. It may be a series of insidious, smoldering events which modify the patient's experiences. He reacts to them and his emotional life is reflected in them. The burden of this report will be to demonstrate the existence of reciprocal influences of the seizure, behavioral and emotional reactions, and social adjustment.

#### CLINICAL MATERIAL AND METHODS

Between December 1958 and November 1961, 21 cases of medically intractable temporal lobe epilepsy underwent temporal lobe surgery at the Neurological Institute of New York.<sup>9, 10</sup> The psychiatric report of this project is based on 13 of these cases which were studied in detail before operation and who were followed postoperatively over a period ranging from 8 to 30 months, with a mean of 23 months.

Each patient was interviewed preoperatively for a minimum of six hours. A complete seizure history was taken and a longitudinal psychiatric study, covering all areas of experience, was made, with continuous emphasis on possible interrelationship with seizure phenomena. Attempts to extend understanding of the patient's inner life were made by inquiring into dreams, fantasies and vivid memories. Each patient underwent a standardized psychiatric examination consisting of evaluation of thought patterns, mood, orientation, memory, retention and recall, calculation, general information, intelligence estimate, insight and judgment, visual and auditory memory and recognition, pantomiming of skilled acts, drawing of house, tree, person and of geometric forms. Ability to abstract, judgment and comprehension of complicated situations were further studied with the picture similarities, picture absurdities, and picture interpretation tests. Reactions to humorous drawings were also used in studying thought patterns. The patient understood that he would be seen by the psychiatrist as well as by other members of the team at regular intervals after operation. He was also told that, as any problems arose, he might feel free to call upon the examiner. In response to this invitation, most of the operated patients maintained personal and telephone contacts throughout their ups and downs of adjustment, thus gaining help and security for themselves and giving to the examiner a continuing picture of their course.

TABLE I—CLASSIFICATION OF PATIENTS ACCORDING TO THE STANDARD APA NOMENCLATURE

|   |       |    |
|---|-------|----|
| 1. Chronic brain syndrome associated with convulsive disorder with: |       | 7  |
| a. postictal psychosis  | 1     |    |
| b. behavior reaction  | 2     |    |
| c. drug intoxication  | 1     |    |
| d. mild cyclical manic depressive reaction                          | 3     |    |
| 2. Depressive reaction with:  |       | 3  |
| a. schizoid tendencies  | 1     |    |
| b. paranoid tendencies  | 1     |    |
| c. anxiety  | 1     |    |
| 3. Personality disorders:   |       | 3  |
| a. passive-aggressive   | 1     |    |
| b. socio-pathic   | 1     |    |
| c. cyclothymic  | 1     |    |
|   | Total | 13 |

## RESULTS

Initially, the patients were classified according to the American Psychiatric Association nomenclature (Table I). The limitations of this approach soon became evident as illustrated in the following case histories.

PATIENT S. G., age 33, was diagnosed as having a cyclothymic personality disorder (Table I, 3c). The mood disorder continued after operation as did his seizures, although they decreased in frequency. However, this categorization does not reveal the real factors which had brought him to accept surgery nor those which determined the effect of operation upon him.

S. G. was trained as an accountant and had several good jobs despite his seizure disorder and a cyclical mood disorder, the phase of which was shifted by the occurrence of the seizures. Two years before operation, he was demoted at his job as accountant because of the behavioral content of his seizures. During his automatisms he would pace from one room to the other and strike anyone in his path. Since his employer doubted that the female employees would put up with this behavior, the patient was sent to another department where there were only men, who could help him cope with his problem. He was willing to have surgery in order to return to his former position. After operation, seizures recurred but were fewer and remained consistently nocturnal. He was able to return to his original job. To him the operation had been successful. The mood disorder continued but was manageable. He even surmounted new difficulties which arose during the first postoperative months and which began to subside only after a year had passed. These consisted of impairment in intellectual tasks and in memory. He found that he was slow in the performance of his work, that he was inaccurate in that he sometimes

transposed figures, and that he had retentive memory difficulty which could be confirmed during clinical examination. His course in outline form reads:

Precipitating situation for operation: Demotion at work.

Psychiatric diagnosis: Cyclothymic personality disorder.

Outcome, in terms of:

Seizures: Improved, fewer and nocturnal.

Precipitating situation: Improved, back at original work.

Psychiatric diagnosis: Same.

PATIENT M. F., age 41, was diagnosed as having a chronic brain syndrome with postictal psychosis (Table I, 1a). He is reported as improved psychiatrically.

M. F. had shown chronic irritability since a brain abscess at the age of 10 years. Despite onset of seizures at age 33, he was able to continue working as a dishwasher. His seizures began with an aura of a cold feeling in his forehead, and a sense of guilt followed by rigidity and staring. This pattern was well tolerated by his environment as attested by the fact that he held the same job for the 10 years preceding operation. However, further treatment was mandatory because of postictal psychotic episodes during one of which he almost killed his wife. During the 27 months following operation he showed a remarkable improvement in his mood as reported by him and his family, and as observed during follow-up examinations. He could not be roused to irritability. There were no psychotic episodes. However, not only did his old seizures return but a new pattern with complex automatisms appeared, incapacitating him completely for work. As an example, he obtained a job but was soon dismissed under the following circumstances: After an aura of dizziness, he went into an automatic state during which he proceeded to the basement of the restaurant, obtained a mop, and began to wash the floor of the restaurant while customers were still dining. The course of this case can be given as follows:

Precipitating situation for operation: Postictal psychosis, paranoid-aggressive type.

Psychiatric diagnosis: Postictal psychosis, paranoid-aggressive type and chronic mood disorder.

Outcome, in terms of:

Seizures: Worse.

Precipitating situation: Improved.

Psychiatric diagnosis: Improved.

Work: Unemployable.

PATIENT B. J., age 44, is classified as drug intoxication (Table I, 1c). This diagnosis does not fully describe the picture of lethargy, limitation of interests, lack of involvement with those around him; in effect, a desperate sort of emptiness extending over the previous several years.

His seizures consisted of an aura of terror followed by an automatic state during which he grimaced fiercely, paced up and down, beating his chest and

TABLE II—CLASSIFICATION OF PSYCHIATRIC MANIFESTATIONS PREOPERATIVELY ACCORDING TO PROBABLE ETIOLOGY

|   |     |
|---|-----|
| 1. Manifestations related to chronic organic dysfunction:   | 3   |
| Syndrome of intellectual impairment, overtalkativeness, impaired social judgment, mood disorder and interference with the stream of associations with paranoid thinking | 3   |
| 2. Manifestations related to major ictal processes:   | 6   |
| a. postictal psychosis  | 1   |
| b. prolonged postictal confusion (S. K., B. J.)   | 2   |
| c. behavior disorder  | 2   |
| d. cyclical mood alteration   | 1   |
| 3. Manifestations related to reactions to the illness:  | 4   |
| a. depression with schizoid reaction  | 1   |
| b. depression with paranoid reaction (C. F.)  | 1   |
| c. depression with anxiety  | 1   |
| d. depression with socio-pathic reaction and possibly real or pseudo-intelligence defect  | 1   |
| 4. Manifestations related to drug toxicity:   | 3   |
| a. confusion (S. K.)  | 1   |
| b. hypersomnia (C. F.)  | 1   |
| c. lethargic states (B. J.)   | 1   |
| Total   | 16* |

\* Total of 16 manifestations were found in 13 patients due, not unexpectedly, to the toxic manifestations and transient psychotic episodes which were superimposed on psychiatric manifestations of other etiology. Initials in parenthesis identify patients doubly entered.

shrieking. Those within sight or earshot were terrified. In his postictal period he had no insight into his mild confusion but his family noticed errors in his paper work. His father had gone to great lengths to provide a business opportunity for him. However, the major seizures drove away the other employees. On the other end of his ictal spectrum, he had, at times, attacks so subtle that the family was not alerted to check his work for errors. Had the seizures been socially more benign, he might have succeeded as a businessman in the tolerant situation of the family business. As it was, he could not be kept in the firm. For 11 years before operation, he had been in psychoanalytic treatment for the attacks which were diagnosed as "hysterical". The patient rejected the idea that his screaming was an unconscious protest against his domineering wife. Once the diagnosis of epilepsy was made, he was tried on various medications which produced the picture of drug intoxication described above, without control of seizures. The course of this case might be outlined as follows:

Precipitating situation for operation: Marked social incapacitation due to uncontrolled seizures and to drug load.

TABLE III.—COMPARISON OF EFFECT OF OPERATION ON SEIZURES AND ON PSYCHIATRIC PROBLEMS

|   | <i>Seizures</i> |                 |             |              | <i>Preoperative<br/>Psychiatric Problem</i> |             |              | <i>Work</i>     |             |              | <i>Interpersonal<br/>Relations</i> |             |              |
|---|-----------------|-----------------|-------------|--------------|---|-------------|--------------|-----------------|-------------|--------------|------------------------------------|-------------|--------------|
|   | <i>None</i>     | <i>Improved</i> | <i>Same</i> | <i>Worse</i> | <i>Improved</i>                             | <i>Same</i> | <i>Worse</i> | <i>Improved</i> | <i>Same</i> | <i>Worse</i> | <i>Improved</i>                    | <i>Same</i> | <i>Worse</i> |
| Patients with chronic organic dysfunction | 3               | 0               | 0           |              | 0   | 2           | 1            | 0               | 1           | 2            | 0                                  | 2           | 1            |
| Others                                    | 5               | 4               | 0           | 1            | 7   | 3           | 0            | 7               | 2           | 1            | 6                                  | 4           | 0            |

Psychiatric diagnosis: Chronic brain syndrome associated with convulsive disorder with drug intoxication.

Outcome in terms of:

Seizures: Marked decline in severity and frequency.

Precipitating situation: Ready for suitable business activity.

Psychiatric diagnosis: Marked improvement; more alert, interested, improved personal relationships.

The discrepancies between the outcomes in the different relevant areas (seizures, psychiatric symptoms, mood, social and work adjustment) led to the development of a classification based on the probable etiology of the psychiatric manifestations, as listed in Table II. Furthermore, it was anticipated that an etiological classification might afford a closer correlation with postoperative prognosis than had been obtained with the standard nomenclature.

Tentative prognostic differences were found when the patients were divided into two groups, one containing those with chronic organic dysfunction and a second group consisting of all other patients (Table III). The results indicate that patients in the first group are less likely to be successful on all counts.

The chronic organic dysfunction group is described in Table II, Section I. These patients are readily recognized as grossly abnormal, bizarre, and tiresome. They have difficulties in their relationships with their families, with outsiders, and even with their doctors. The distortion of the patients' behavior may have its roots in a chronic perceptual defect resulting from a localized lesion in the temporal lobe. However, another observable mechanism may be the minimal clinical seizure which tends to modify behavior in two ways: 1) interference with

responses to complex auditory and visual stimuli; 2) shifts from rational to impulsive, often contradictory, verbal expression or behavior.

Inappropriate responses to auditory and visual stimuli were observed in a range extending from mild to marked. An example of the mild form is the statement of the patient who says, "I hear the words but I don't always understand." The family, employers, and so on, also say that the patient requires several repetitions of simple explanations; that "he doesn't catch the point the way other people do"; or/and "I tell her she must listen and learn to follow instructions." In conversation, such patients seem to ignore what is said to them, and continue their monologue, thus minimizing the necessity of coping with the verbal expression of their interlocutor. If constrained to listen, they may give a tangential answer and go on with their own stream of talk. The social consequences of this impairment may be compared with those experienced by a person with a mild intelligence defect.

An example of more marked disruption in a patient's responses can be seen in the following behavioral sequence in a group of seizures which occurred several weeks after operation. When the patient came, she brought a book which she wanted to show to the examiner. While talking about her father's problems, she had a seizure during which she merely fumbled with the book in her lap. When the examiner called her name, the patient responded with, "Who me? I'm wide awake. Don't worry about me." She said nothing about awareness of her seizure, but began to talk about the cosmetic problem relating to her short hair (postoperative). "Mother thinks I should wear my cap." The examiner asked, "What does your father think?" and the patient answered, "My father thinks the same." When there was another brief seizure, the examiner asked, "What did they think?", whereupon the patient said, "They think the same thing—what do they think about me?" After another seizure, she said, "I will not read to please others." Following some of the small seizures, she would abruptly leave the subject at hand, then say, "and so very nicely"—and go on to some other unrelated topic.

This behavior was characterized by the following development: an exchange of talk was interrupted by a small seizure associated with confusion and amnesia. Upon recovery from the attack, behavior was aimed at concealment of the attack. Disruption of communication was apparent when the patient resumed conversation. Either she continued

on the previous theme with misinterpretations and distortions, sometimes with paranoid development, or she lost the theme and reacted to an external stimulus in her immediate environment, e.g., the book in her lap.

The second element which contributes to the distortion in the patient's behavior is the ictally-produced or ictally-related shift from rational to impulsive, often contradictory, verbal expression or behavior. Sometimes this shift is clearly time-locked to a seizure which is usually minimal. In interviews, it has been observed in one patient that directly following a small seizure, her spontaneous recital shifted from an appropriate evaluation of her situation to her usually unexpressed emotional reaction to that situation. Thus, the patient spoke of her gratitude for a suitable job which had been secured for her. After a small seizure, as if unaware of her previously expressed attitude, she said vehemently that she would have to leave this office, and voiced her criticisms, with paranoid ideation, about the extent to which she was singled out in subtle ways by her fellow employees.

Other observed disturbances of social judgment in every-day situations evolved over a longer period of time. These disturbances were noted during intervals of increased seizure frequency and reflected a similar shift from rational to impulsive, often contradictory, verbal expression or behavior. During one interview, the telephone rang while the patient was sitting at the opposite side of the desk from the telephone. Without a word, the patient reached in front of the examiner and answered the telephone as if she were the receptionist she wished to be. On another occasion she intruded into the EEG laboratory where a test was being run on another patient. Without asking the technician, she went over to the patient and told her how to cooperate with the test. When the technician tried gently to ease her out, the patient said that she knew all about this procedure, she had done volunteer work at a hospital, and that if she could be of any help, of course she would have to do it.

Clinical observations of this kind are being extended in the psychology laboratory with Dr. Sidney Weinstein and Miss Linda Johnson, who are conducting perceptual and cognitive studies on different levels of complexity.

#### SUMMARY

An attempt has been made to show the inseparable relationships between seizures and the emotional reactions, day-to-day experiences, and



behavior. The descriptive approach has been chosen to emphasize how the epileptic patient, as a person, is affected by the illness and by operation. Because experiences most disturbing to the patient before and after operation were not clearly reflected in the formal psychiatric diagnosis, nor in the statistical report of the results of surgery, the patients were divided into four groups according to probable etiology of their psychiatric manifestations: 1) manifestations related to chronic organic dysfunction; 2) manifestations related to major ictal processes; 3) manifestations related to reactions to the illness; 4) manifestations related to drug toxicity.

In cases of gross chronic dysfunction (group 1), a chronic perceptual defect may exist, due to the nature and localization of the physiological disturbance. In the patients in group 1, the clinically minimal seizure may represent a possible mechanism of behavior distortion arising from interference with responses to auditory and visual stimuli. There may also be shifts from rational to impulsive, often contradictory, verbal expression or behavior. Further study may reveal that patients classified in groups 2, 3 and 4 also tend to show some degree of chronic organic dysfunction. All patients, even those in group 1 with guarded prognosis, benefited in some way from the operation. In this study, therefore, no psychiatric evidence contraindicating operation has been found.

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